

## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

**03 - Advanced Technology Development****0603112F Advanced Materials for Weapon Systems**

COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	31,726	33,978	21,678	20,778	22,398	23,279	24,456	Continuing	TBD
632100 Laser Hardened Materials	9,949	11,107	10,730	11,094	11,842	12,079	12,319	Continuing	TBD
633153 Non-Destructive Inspection Development	4,079	4,300	2,218	3,637	3,474	3,814	4,154	Continuing	TBD
633946 Materials Transition	17,698	18,571	8,730	6,047	7,082	7,386	7,983	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

Note: In FY 2004, Air Base Technology efforts currently funded in PE 0603205F will transfer into this PE in Project 633946.

(U) **A. Mission Description**

This program demonstrates materials technology options for transition into Air Force weapon systems. The non-destructive inspection/evaluation (NDI/E) techniques for fighter, bomber, and transport aircraft are critical to the logistics centers as well as the operational fleet as the planned service lives of these systems increase and new materials are introduced. This program provides critical data for prospective users to make engineering decisions on both structural and non-structural materials for air and space. Reducing risk in materials technology improves the affordability, supportability, reliability, survivability, and operational performance of current and future warfighting systems. Also developing materials technologies for the broadband laser protection of aircrews and sensors from a variety of threats is a high priority of the Air Force. Note: In FY 2000, Congress added \$4.0 million for advanced low-observable coatings and \$4.5 million for composite space launch payload dispensers which partially explains the perceived decrease in FY 2001.

(U) **B. Budget Activity Justification**

This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.

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## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

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PE NUMBER AND TITLE

**03 - Advanced Technology Development****0603112F Advanced Materials for Weapon Systems**(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)	32,900	25,890	25,702	
(U) Appropriated Value	33,006	34,390		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-106	-1		
b. Small Business Innovative Research	-977			
c. Omnibus or Other Above Threshold Reprogram		-187		
d. Below Threshold Reprogram	-19			
e. Rescissions	-178	-224		
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR			-4,024	
(U) Current Budget Submit/FY 2001 PBR	31,726	33,978	21,678	TBD

(U) **Significant Program Changes:**

Changes to this program since the previous President's Budget reflect reduced emphasis on implementation of Integrated Product Process Development (IPPD) and vehicle health monitoring technology.

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)</b>								DATE <b>February 2000</b>	
BUDGET ACTIVITY <b>03 - Advanced Technology Development</b>				PE NUMBER AND TITLE <b>0603112F Advanced Materials for Weapon Systems</b>				PROJECT <b>632100</b>	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
632100 Laser Hardened Materials	9,949	11,107	10,730	11,094	11,842	12,079	12,319	Continuing	TBD
<p>(U) <b><u>A. Mission Description</u></b>            Develops enabling materials and concepts for protecting Air Force assets such as aircrews, munitions, and aerospace sensors against laser and high power microwave (HPM) directed energy threats. Concepts are demonstrated to provide hardening options for transition to Air Force systems. The goal is to ensure mission capability before, during, and after threat exposure. The world laser market is rapidly expanding with easy export to any nation. Survivability solutions must account for a variety of lasers facing a mission. Current protection schemes are activated by intensity or color and are only capable of countering a specific portion of the laser threat. To harden systems against all potential lasers a combination of approaches is required.</p> <p>(U) <b><u>FY 1999 (\$ in Thousands)</u></b></p> <p>(U) \$1,463      Developed and demonstrated advanced materials technologies that enhance laser hardening of Air Force aircraft and spacecraft structures to ensure safety, survivability, and operability in a laser threat environment.</p> <p>(U) \$4,270      Developed and demonstrated advanced materials technologies that enhance laser hardening for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in a laser threat environment.</p> <p>(U) \$4,216      Developed and demonstrated advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of electronic systems.</p> <p>(U) \$9,949      Total</p> <p>(U) <b><u>FY 2000 (\$ in Thousands)</u></b></p> <p>(U) \$1,666      Develop and demonstrate advanced materials technologies that enhance laser hardening of Air Force spacecraft sensors to ensure safety, survivability, and operability in a laser threat environment. Evaluate hybrid optical limiters and establish specific performance improvement goals for the protection of staring focal plane arrays (FPAs). Optimize Rugate fixed-wavelength filters and optical switches for mid-wave infrared (MWIR) space systems. Evaluate hardening solutions for critical space sensor designs and environments.</p> <p>(U) \$5,554      Develop and demonstrate advanced materials technologies that enhance laser hardening for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in a laser threat environment. Design and develop fixed filters for panoramic night vision goggles (PNVG). Fabricate and test wrap-around tristimulus spectacles (eye-glasses). Design and develop prescription capable flexible filter for eye protection. Demonstrate prescription-capable, eye-centered Rugates on lenses with dyed plastic substrates. Transition eye centered Rugate spectacles for preliminary human factors study.</p> <p>(U) \$3,887      Develop and demonstrate advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase</p>									
<div style="display: flex; justify-content: space-between;"> <span>Project 632100</span> <span>Page 3 of 12 Pages</span> <span>Exhibit R-2A (PE 0603112F)</span> </div>									

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>03 - Advanced Technology Development</b>	<b>0603112F Advanced Materials for Weapon Systems</b>	<b>632100</b>
(U) <u><b>A. Mission Description Continued</b></u>		
(U) <u>FY 2000 (\$ in Thousands) Continued</u>		
	survivability and mission effectiveness of air vehicles systems. Integrate laser hardening modules into operational electro-optical systems. Perform flight test demonstrations of hardened sensor for Air Force Special Operational Command. Characterize and transition enhanced sensor modules for Air Force targeting systems. Initiate development of hardening architecture for low light level television (LLTV) systems.	
(U) \$11,107	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$1,609	Develop and demonstrate advanced materials technologies that enhance laser hardening of Air Force spacecraft sensors to ensure safety, survivability, and operability in a laser threat environment. Fabricate and characterize hybrid optical limiters for the protection of staring focal plane arrays (FPAs). Fabricate Rugate fixed-wavelength filters and optical switches for mid-wave infrared (MWIR) space systems. Develop hardening solutions for critical space sensor designs and environments based on successful approaches employed in tactical sensors.	
(U) \$5,365	Develop and demonstrate advanced materials technologies that enhance laser hardening for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in a laser threat environment. Develop fixed filters and invisible laser eye protection visor for panoramic night vision goggles (PNVG). Evaluate tunable filter PNVG protection technology. Validate wrap-around tristimulus spectacles (eye-glasses). Develop prescription capable flexible filter for eye protection. Transition prescription-capable, eye-centered Rugates on lenses with dyed plastic substrates.	
(U) \$3,756	Develop and demonstrate advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of air vehicles systems. Fabricate high performance Rugate filters for hardened LLTV systems. Initiate development of specific hardening techniques for specific munitions. Develop specific hardening techniques for MWIR and long-wave infrared (LWIR) staring forward looking infrared (FLIR) systems.	
(U) \$10,730	Total	
(U) <u><b>B. Project Change Summary</b></u>		
	Not Applicable.	
(U) <u><b>C. Other Program Funding Summary (\$ in Thousands)</b></u>		
(U) Related Activities:		
(U) PE 0602102F, Materials.		
(U) PE 0602202F, Human Effectiveness Applied Research.		
(U) PE 0603231F, Crew Systems and Personnel Protection Technology.		
(U) PE 0604706F, Life Support System		
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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>03 - Advanced Technology Development</b>	<b>0603112F Advanced Materials for Weapon Systems</b>	<b>632100</b>
<p>(U) <b><u>C. Other Program Funding Summary (\$ in Thousands)</u></b></p> <p>(U) Coordinated through the Tri-Service Laser Hardening Materials and Structures Working Group and the Joint Service Agile Laser Eye Protection Program.</p> <p>(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.</p> <p>(U) <b><u>D. Acquisition Strategy</u></b> Not Applicable.</p> <p>(U) <b><u>E. Schedule Profile</u></b> Not Applicable.</p>		
<p>Project 632100</p> <p>Page 5 of 12 Pages</p> <p>Exhibit R-2A (PE 0603112F)</p>		

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BUDGET ACTIVITY <b>03 - Advanced Technology Development</b>				PE NUMBER AND TITLE <b>0603112F Advanced Materials for Weapon Systems</b>				PROJECT <b>633153</b>	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
633153    Non-Destructive Inspection Development	4,079	4,300	2,218	3,637	3,474	3,814	4,154	Continuing	TBD
<p>(U)    <b><u>A. Mission Description</u></b>            Develops and demonstrates advanced Non-Destructive Inspection/Evaluation (NDI/E) technologies to monitor performance integrity and to detect failure causing conditions in weapon systems components and materials. NDI/E capabilities greatly influence and/or limit many designs, manufacturing, and maintenance practices. Reduction in the number of fighter wings and the need for rapid sortie generation demand an ability to perform real-time NDI/E faster than current capability. This project provides technology to satisfy critical Air Force requirements to extend lifetimes of current systems through increased reliability and cost-effectiveness at field and depot maintenance levels, as well as assuring manufacturing quality, integrity, and safety requirements.</p> <p>(U)    <b><u>FY 1999 (\$ in Thousands)</u></b></p> <p>(U)    \$2,750      Developed advanced technologies for improved capabilities in materials corrosion and fatigue monitoring and testing of aging aircraft to reduce operation and maintenance costs and to guarantee full operability and safety of the aircraft fleet.</p> <p>(U)    \$554      Developed advanced inspection technologies supporting low-observable (LO) and space systems to enhance affordability and ensure full performance and survivability of LO systems and rapid turnaround of space systems.</p> <p>(U)    \$775      Developed advanced technologies for improved NDI/E capabilities in materials and process testing, monitoring, inspection, and maintenance to reduce cost and increase reliability of advanced materials.</p> <p>(U)    \$4,079      Total</p> <p>(U)    <b><u>FY 2000 (\$ in Thousands)</u></b></p> <p>(U)    \$1,541      Develop and demonstrate advanced technologies for improved capabilities in materials corrosion and fatigue monitoring and testing of aging aircraft to reduce operation and maintenance costs and to guarantee full operability and safety of the aircraft fleet. Demonstrate enhanced laser generated ultrasonics (LGU) for corrosion detection that use an alternate source of laser pulses to generate ultrasound and are efficiently transmitted through fiber optics, thus enabling laser based ultrasonics (LBU) sensors for remote access inspection. Demonstrate a high-resolution digital radiography technique to evaluate and characterize cracks as an alternative to current X-ray film-based systems which eliminates the need for hazardous material usage and enables electronic storage, transmission, and analysis of images.</p> <p>(U)    \$2,144      Develop and demonstrate advanced inspection technologies supporting LO and space systems to enhance affordability and ensure full performance and survivability and rapid turnaround of space systems. Validate a signature assessment tool for fighter aircraft and initiate development of an advanced multispectral LO nondestructive evaluation (NDE) tool for assessing radio frequency (RF) signature (zone vs. whole aircraft) that is real-time, small, lightweight, portable, user friendly and covers multiple frequency bands. Select multiple NDE methods to</p>									
<div style="display: flex; justify-content: space-between;"> <span>Project 633153</span> <span>Page 6 of 12 Pages</span> <span>Exhibit R-2A (PE 0603112F)</span> </div>									

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BUDGET ACTIVITY <b>03 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603112F Advanced Materials for Weapon Systems</b>	PROJECT <b>633153</b>
<p>(U) <u><b>A. Mission Description Continued</b></u></p> <p>(U) <u><b>FY 2000 (\$ in Thousands) Continued</b></u></p> <p>(U) \$615 detect changes in key material properties necessary for ten-year service life estimate prediction of solid rocket motors. This technology provides improved capabilities to monitor vehicle health and enables anticipatory condition-based maintenance actions on aerospace vehicles.</p> <p>(U) \$615 Develop and demonstrate advanced technologies for improved capabilities to assess high cycle fatigue (HCF) and engine life prediction practices to extend the total 'safe' life of turbine engine disks. Establish nondestructive evaluation (NDE) benchmarks and design an automated inspection capability to inspect engine rotary components for planned life extension of engine rotors. Establish a baseline capability to retain digital NDE records for extended periods and enable enhanced analysis of the aging aircraft fleet.</p> <p>(U) \$4,300 Total</p> <p>(U) <u><b>FY 2001 (\$ in Thousands)</b></u></p> <p>(U) \$696 Develop and demonstrate advanced technologies for improved capabilities in materials corrosion and fatigue monitoring and testing of aging aircraft to reduce operation and maintenance costs and to guarantee full operability and safety of the aircraft fleet. Transition to industry enhanced laser generated ultrasonics (LGU) for corrosion detection that use an alternate source of laser pulses to generate ultrasound and are efficiently transmitted through fiber optics thus enabling laser based ultrasonics (LBU) sensors for remote access inspection. Transition a high-resolution digital radiography technique to evaluate and characterize cracks as an alternative to current X-ray film-based systems which eliminates the need for hazardous material usage and enables electronic storage, transmission, and analysis of images.</p> <p>(U) \$870 Develop and demonstrate advanced inspection technologies supporting low-observable systems to enhance affordability and ensure full performance and survivability. Transition a low-observable material assessment tool for fighter aircraft. Develop an advanced multispectral low-observable NDE tool for assessing radio frequency (RF) signature (zone vs. whole aircraft) that is real-time, small, lightweight, portable, user friendly, and covers multiple frequency bands. Initiate an advanced hand-held directional reflectometer (HHDR) for field level infrared (IR) signature NDE.</p> <p>(U) \$552 Develop and demonstrate advanced technologies for improved capabilities to assess high cycle fatigue (HCF) and engine life prediction practices to extend the total 'safe' life of turbine engine disks. Evaluate NDE benchmarks and develop an automated inspection capability to inspect engine rotary components for planned life extension of engine rotors. Develop a method to retain digital NDE records for extended periods and enable enhanced analysis of the aging aircraft fleet.</p> <p>(U) \$100 Develop and demonstrate advanced technologies for improved capabilities to monitor vehicle health and enable anticipatory condition-based maintenance actions on aerospace vehicles. Investigate interfaces to material behavior prediction tools. Establish a NDE baseline capability method to detect changes in key material properties necessary for ten-year service life estimate prediction of solid rocket motors.</p> <p>(U) \$2,218 Total</p>		
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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>03 - Advanced Technology Development</b>	<b>0603112F Advanced Materials for Weapon Systems</b>	<b>633153</b>
<p>(U) <b><u>B. Project Change Summary</u></b> Not Applicable.</p> <p>(U) <b><u>C. Other Program Funding Summary (\$ in Thousands)</u></b> (U) Related Activities: (U) PE 0602102F, Materials. (U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.</p> <p>(U) <b><u>D. Acquisition Strategy</u></b> Not Applicable.</p> <p>(U) <b><u>E. Schedule Profile</u></b> (U) Not Applicable.</p>		
<p>Project 633153</p> <p>Page 8 of 12 Pages</p> <p>Exhibit R-2A (PE 0603112F)</p>		



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BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

03 - Advanced Technology Development

0603112F Advanced Materials for Weapon Systems

633946

COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
633946 Materials Transition	17,698	18,571	8,730	6,047	7,082	7,386	7,983	Continuing	TBD

(U) **A. Mission Description**

Develops and demonstrates a materials technology base to achieve its acceptance by designers by reducing the time to scale-up new defense-related materials and material processes. The goal is to reduce risk, improve confidence, and reduce cost of the incorporation of new materials into weapons, airframes, engines, and space applications. Advanced materials and related processes that have matured beyond applied research are characterized and critical data are collected to reduce the risk of demonstrating these technologies in Air Force applications. Critical evaluations of materials in the proposed design environment are performed. This design and scale-up data provides confidence to transition new materials for upgrading current systems and integrate into future Air Force systems as well as providing the initial incentive for their industrial development. Also develops technologies (i.e., utilities and shelters) that improve airmobile systems performance and reduce airlift requirements in support of Air Expeditionary Force (AEF) operations.

(U) **FY 1999 (\$ in Thousands)**

- (U) \$14,252 Developed technologies and databases to facilitate timely transition of advanced structures, propulsion, and subsystems materials to warfighters, industry, and academia.
- (U) \$3,009 Developed technologies and databases to facilitate timely transition of advanced materials for high power radars, space-based sensors, and infrared countermeasures to warfighters, industry, and academia.
- (U) \$437 Developed technologies and databases to facilitate timely transition of advanced materials for improved systems support and operational support to warfighters, industry, and academia.
- (U) \$17,698 Total

(U) **FY 2000 (\$ in Thousands)**

- (U) \$5,277 Develop and demonstrate advanced materials technologies for air vehicles and subsystems to enhance lift, propulsion, low-observable performance, and affordability of manned and unmanned air vehicles. Develop advanced aircraft brake materials with improved braking capacity, increased life, and better environmental stability. Develop large integrated composite structures for aircraft with reduced part count and assembly costs. Develop advanced non-linear optical (NLO) materials for aircraft infrared countermeasure (IRCM) against far-infrared laser sources.
- (U) \$7,050 Develop and demonstrate advanced materials technologies for space vehicles and subsystems to provide enhanced surveillance and sensing capabilities and improved access to space. Initiate development of robust, high performance and producible infrared (IR) focal plane array (FPA) materials. Develop materials and materials processing technologies to improve spacecraft component designs, performance, and reliability.

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Exhibit R-2A (PE 0603112F)

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BUDGET ACTIVITY <b>03 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603112F Advanced Materials for Weapon Systems</b>	PROJECT <b>633946</b>
(U) <u><b>A. Mission Description Continued</b></u>		
(U) <u><b>FY 2000 (\$ in Thousands) Continued</b></u>		
(U) \$975	Develop and demonstrate advanced materials technologies to enhance the sustainability of Air Force air and space systems by lowering operations and maintenance costs and ensuring full operability and safety of systems and personnel. Develop and verify an accelerated environmental effects test to determine in-service performance degradation of aircraft coating systems and initiate development of large aperture Aluminum Oxynitride (ALON) window material with high optical quality, durability, and strength. Demonstrate the utilization of residual stress measurements in the fatigue life management of turbine engine disks.	
(U) \$2,367	Provide affordability education and training through the application of Integrated Product and Process Development (IPPD) tenets and cost modeling to the Air Force Science and Technology (S&T) environment. Training is focused on Air Force S&T scientists and engineers, including executives, middle managers, and all advanced development program managers. Enhance IPPD and cost modeling course material, including web-based methods and tools.	
(U) \$2,902	Develop technologies (i.e., utilities and shelters) that improve airmobile systems performance and reduce airlift requirements in support of Air Expeditionary Force (AEF) operations. Emphasize two areas of AEF operations: deployed base systems and physical force protection. Demonstrate small air-inflatable shelters that reduce deployment weight by 50% and require 30% less set-up time. Fabricate advanced cycle technologies for mobile heat pumps that reduce weight and volume by 30%. Develop a small-footprint fuel cell reformer capable of converting logistics fuels into hydrogen for fuel cell power generation. Develop structural retrofit and evaluate deployable blast protection reinforcement systems for buildings to reduce blast debris hazards.	
(U) \$18,571	Total	
(U) <u><b>FY 2001 (\$ in Thousands)</b></u>		
(U) \$1,461	Develop and demonstrate advanced materials technologies for air vehicles and subsystems to enhance lift, propulsion, low-observable performance, and affordability of manned and unmanned air vehicles. Fabricate advanced aircraft brake materials with improved braking capacity, increased life, and better environmental stability. Fabricate large integrated composite structures for aircraft with reduced part count and assembly costs. Validate advanced non-linear optical (NLO) materials for aircraft infrared countermeasure (IRCM) against far-infrared laser sources.	
(U) \$2,145	Develop and demonstrate advanced materials technologies for space vehicles and subsystems to provide enhanced surveillance and sensing capabilities and improved access to space. Develop improved material processes with increased yields for robust, high performance and producible infrared (IR) focal plane array (FPA) materials. Demonstrate materials and materials processing technologies to improve spacecraft component designs, performance, and reliability. Initiate effort to develop the key data needed for reduced risk and increased confidence in organic matrix composite materials.	
(U) \$1,884	Develop and demonstrate advanced materials technologies to enhance the sustainability of Air Force air and space systems by lowering	
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PROJECT <b>633946</b>		
<p>(U) <b><u>A. Mission Description Continued</u></b></p> <p>(U) <b><u>FY 2001 (\$ in Thousands) Continued</u></b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 15%;"> <p>operations and maintenance costs and ensuring full operability and safety of systems and personnel. Validate an accelerated environmental effects test to determine in-service performance degradation of aircraft coating systems. Fabricate a large aperture Aluminum Oxynitride (ALON) window material with high optical quality, durability, and strength. Transition the utilization of quantitative residual stress measurements in the fatigue life management of turbine engine disks.</p> <p>(U) \$450 Provide affordability education and training through the application of Integrated Product and Process Development (IPPD) tenets and cost modeling to the Air Force Science and Technology (S&amp;T) environment. Training is focused on Air Force S&amp;T scientists and engineers, including executives, middle managers, and all advanced development program managers. Initiate education and training of organic IPPD and cost modeling experts in each Air Force S&amp;T Technical Directorate.</p> <p>(U) \$2,790 Develop technologies (i.e., utilities and shelters) that improve airmobile systems performance and reduce airlift requirements in support of Air Expeditionary Force (AEF) operations. Emphasize two areas of the AEF operations: deployed base systems and physical force protection. Develop scaled air-inflatable frames for large shelters. Demonstrate advanced cycle technologies for mobile heat pumps that reduce weight and volume by 30%. Fabricate a small-footprint fuel cell reformer capable of converting logistics fuels into hydrogen for fuel cell power generation. Fabricate structural retrofits and develop deployable blast protection reinforcement systems for buildings to reduce blast debris hazards.</p> <p>(U) \$8,730 Total</p> </div> <div style="width: 85%;"> <p>(U) <b><u>B. Project Change Summary</u></b> Not Applicable.</p> <p>(U) <b><u>C. Other Program Funding Summary (\$ in Thousands)</u></b></p> <p>(U) Related Activities:</p> <p>(U) PE 0602102F, Materials.</p> <p>(U) PE 0603211F, Aerospace Structures</p> <p>(U) PE 0603202F, Aerospace Propulsion Subsystem Integration</p> <p>(U) PE 0603203F, Advanced Aerospace Sensors.</p> <p>(U) PE 0603216F, Aerospace Propulsion and Power Technology.</p> <p>(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.</p> <p>(U) <b><u>D. Acquisition Strategy</u></b> Not Applicable.</p> </div> </div>		
<div style="display: flex; justify-content: space-between;"> <span>Project 633946</span> <span>Page 11 of 12 Pages</span> <span>Exhibit R-2A (PE 0603112F)</span> </div>		

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(U) <u>E. Schedule Profile</u> (U) Not Applicable.		
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